

## REMARKS

In the Office Action, the Examiner rejected claims 1-3 and 5-7 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,367,246 (Hirota) in view of U.S. Patent No. 6,220,022 (Müller). For at least the reasons provided below, Applicants request that the Examiner reconsider the rejection.

*First*, Hirota discloses a particulate filter (his reference number 18 in figures 1 and 2) that is within his catalytic converter (his reference number 19). See also col. 3, lines 53-60 of Hirota. His particulate filter comprises an HC adsorbent (his reference number 63a in figure 2) and is not distinct from the HC adsorbent. See col. 4, lines 14-28, and col. 4, line 63 - col. 5, line 6 of Hirota.

Accordingly, Applicants respectfully point out that the Examiner was incorrect when in describing Hirota he wrote “the hydrocarbon adsorber is arranged closely upstream of the particulate filter (18, 60).” (Page 2 of Office Action.) As noted above, a closer examination of the figures of Hirota reveals that his hydrocarbon adsorber is part of, and not upstream of his filter. This is distinct from Applicants’ explicitly claimed feature of “the particulate filter is separated from the hydrocarbon adsorber.” See Applicants’ claim 1. Moreover, the Examiner has not identified any portion of Hirota or any other reference that discloses this feature.

*Second*, Hirota’s inclusion of the HC adsorbant within his filter and not upstream of it, is dictated by his choice of how to regenerate his filter. Thus, it is a critical element of his system.

Hirota envisions a system in which gases can enter his filter from both directions. See col. 5, lines 53-67. When the filter is in normal use, trapping particles, exhaust gas enters from upstream and exits downstream. However, when regenerating his filter, Hirota’s exhaust gas first bypasses the filter and thus does not enter it on its upstream end, and instead, secondary air may be heated and then caused to enter the filter from its downstream end. *Id.* (“The secondary air, which is heated by the burner 29 after discharged from the secondary air pump 23, flows through the particulate filter 18 from the exhaust gas downstream end 18d and flows out of the exhaust gas upstream end 18u.”) This causes ashes generated by burning particulates to be removed from the filter. See col. 6, lines 1-6. This heat also causes the NOx and HC within his filter unit to be desorbed. When both of these components are simultaneously desorbed one can

be oxidized and the other reduced. If the HC adsorber were not part of the filter, then the NO<sub>x</sub> could not successfully be reduced to innocuous materials, because there would be no substances to be oxidized. Thus, the inclusion of the HC adsorber in the particulate filter is a critical component of Hirota's system and its ability to regenerate itself. To separate his HC adsorber from his filter would render his system unable to regenerate the filter. Therefore, he teaches away from separating the two as is required by Applicants' claims.

*Third*, Hirota fails to disclose a feature that corresponds to Applicants' first oxidation catalyst. The Examiner acknowledged the absence of this feature in Hirota. (Page 3 of Office Action.) Instead, the Examiner pointed to Müller as disclosing this feature. However, although Müller teaches the use of two catalysts, even if a person of ordinary skill in the art were to combine Müller with Hirota, he would not arrive at the claimed invention.

Müller, like Hirota recommends making an adsorber for hydrocarbons part of a catalyst. However, unlike Müller, he recommends making it part of the catalyst that is adjacent to an engine. See col. 4, lines 49 -56 of Müller. Thus, if a person of ordinary skill in the art were to combine Müller and Hirota, and as the Examiner suggests, arrive at a system in which there are two catalysts, he still would not have any motivation to separate the hydrocarbon adsorber and place it in the location upstream of a filter and far downstream of the first catalyst.

*Fourth*, nothing in the either reference suggests that the low level Pt content in Applicants' claimed adsorber would render the system functional. Applicants' emphasize that by specifying this low level of Pt, their adsorber will work only as a decoking catalyst and does not act as a catalyst that can sufficiently reduce HC-components. As the accompanying excerpt from Heck *et al.* shows, nearly zero reduction of HC is accomplished with a catalyst that has 2g/ft<sup>3</sup> (0/07 g/l) Pt on it. Moreover, Applicants emphasize that Hirota teaches away from this feature because he urgently needs a sufficiently active species on his HC adsorber. See col. 6, lines 7 *et seq.* of Hirota. Therefore, until Applicants' invention, a person of ordinary skill in the art would not have been motivated to use Applicants' claimed amount of Pt.

Because as described above Hirota teaches away from the claimed invention, and even if a person of ordinary skill in the art were to combine Hirota and Müller, he would not arrive at the claimed invention, Applicants ask the Examiner to withdraw the rejection with respect to claim 1, and the claims that depend on it, claims 2, 3 and 5-7.

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Applicants have also added new claim 9, which specifies that the first catalyst contain either no zeolites or only a small amount of zeolites. Support for this new claim appears in paragraph [0021] of US 2007/0119152.

Even if the Examiner were to maintain his rejection of claim 1, Applicants submit that claim 9 would nonetheless be patentable because Hirota recites that his HC adsorber is part of a catalyst and the HC is absorbed by a zeolite. Thus, he recommends using a zeolite as part of his catalyst. By contrast, Applicants, by placing their first catalyst close to the engine realized that the high temperature of the exhaust would render a zeolite useless there. (Par. [0021] of US 2007/0119152.) Similarly, Müller's recommendation to place an HC adsorbant feature in his catalyst that is adjacent to the engine is incompatible with the use of no or very little zeolites in the first catalyst.

Reconsideration and allowance are respectfully requested. If any further fees are deemed due, or an overpayment has been made, please charge, or credit, Deposit Account No. 11-0171 for such sum. If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,

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